



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/686,451	10/15/2003	Christopher J. Capece	67,108-022; Capece 2-11	6861
David J. Gaskey Carlson, Gaskey & Olds, PC Suite 350 400 West Maple Road Birmingham, MI 48009				
EXAMINER				
LAM, DUNG LE				
ART UNIT		PAPER NUMBER		
2617				
MAIL DATE		DELIVERY MODE		
11/13/2009		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/686,451

**Applicant(s)**

CAPECE ET AL.

**Examiner**

DUNG LAM

**Art Unit**

2617

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 7/1/09.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/55/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims **1, 8 and 14** rejected under 35 U.S.C. 103(a) as being unpatentable over **Jin** (US Pub. No. 2003/0012158) in view of **Martin** (WO 03/067463A2).

2. Regarding claim **1**, **Jin** teaches a method of maintaining time information for a wireless communications base station, comprising:

selectively using time information from the a data set for conducting a communication involving the base station (The system selects another source of time information from another source when the GPS signal is loss; see Abstract, Fig. 6, [0036-0037, 0019, 0021, 0028]).

However, Jin does not teach that the data set is generated by a neural network to provide future values. In an analogous art, **Martin** teaches a neural network receiving input past values of a numeric data time flow and outputs its predictive values for the numeric data time flow (Abstract, See third to last page labeled "Page 1 or 2", Section <Desc/Clms Page Number1>). It is well known in the art that the extrapolated/predicted values generated by a neural network yields more adaptively and accurately extrapolated future values than other traditional method of extrapolation.

Therefore, it would have been obvious for one skill in the art at the time of the invention to modify Jin's teaching of GPs time synchronization to use the known neural network to predict/extrapolate future data time flow values as taught by **Martin** to yield a method of extrapolating future values more adaptively and accurately.

3. Regarding claim **14**, **Jin** teaches a wireless communication device, comprising: a base station controller that determines time information from a global position system (GPS) source of time information and uses the data set for obtaining time information if the GPS source is unavailable to the base station controller. (The system selects another source of time information from another source when the GPS signal is loss. See Abstract, Fig. 6, [0036-0038, 0019, 0021, 0028]).

However, Jin does not teach that the data set is generated by a neural network to provide future values. In an analogous art, **Martin** teaches a neural network receiving input past values of a numeric data time flow and outputs its predictive values for the numeric data time flow (Abstract and <Desc/Cims Page Number1>).

It is known in the art that the extrapolated/predicted values generated by a neural network yields more adaptively and accurately extrapolated future values than other traditional method of extrapolation.

Therefore, it would have been obvious for one skill in the art at the time of the invention to modify Jin's teaching of GPs time synchronization to use the known neural network to predict/extrapolate future data time flow values as taught by **Martin** to yield a method of extrapolating future values more adaptively and accurately.

Regarding claim 8, the combination of **Jin and Martin** teach all the steps method of claim 1, including receiving time information from an external source ([0036-0037]); determining when the external source time information is not available ([0036-0038]); and using the data set for time information when the external source time information is not available (Abstract and <Desc/Cims Page Number1>).

4. Claim 4-7, 9, 11-13, 17-20 rejected under 35 U.S.C. 103(a) as being unpatentable over **Jin and Martin** further in view of **Telia** (EP 631 453).
5. **Jin and Martin** teach all the steps of **claims 4 and 17**. Jin further teaches the step of gathering time information from an external source ([0036-0037]); However they do not explicitly teach the step of inputting the gathered time information to the neural network; and generating the data set based on the inputted time information. In an analogous art, **Telia** teaches the step of gathering data to be input to the neural network (C2 L2-25, C3 L46 – C4 L9) and generating data based on the input data (C3 L46 – C4 L9). Therefore, it would have been obvious for one of ordinary skill in the art at the time of the invention to apply Telia's teaching of feeding data to the neural network prior to generating the data to John and Admitted PriorArt in order to comply with the way neural network typically operates.
6. **Jin, Martin and Telia** teach all the steps of **claim 5**, wherein Telia further teaches that the gathered time information extends over a selected period (C3 L9 - 18) and including comparing time information from the data set for a period corresponding to the selected period with the gathered time information; and changing at least one

characteristic of the neural network when the data set time information does not correspond to the gathered time information within a selected range (C3 L46 - C4 L9, this section describes the well known learning process of the neural network).

7. **Jin, Martin and Telia** teach all the steps of **claim 6**, including changing the characteristic of the neural network by changing at least one of a number of layers in the neural network, a number of neurons in the neural network or a complexity factor of the neural network. It would have been obvious to one of ordinary skill in the art at the time the invention was made, to understand that for the neural network to learn, one of the above characteristics would have to be adjusted, as this is a known method of teaching/learning in a neural network.

8. **Jin, Martin and Telia** teach all the steps of **claim 7**, including repeatedly performing the steps of comparing and changing until the data set time information corresponds to the gathered time information within the selected range (Telia, C3 L46 - C4 L9).

9. **Jin** in view of **Martin** teach all the steps of **claim 9**, except for using an initialization time value and the data set to generate time information until the external source time information becomes available. In an analogous art, Telia teaches the concept of using the initialization time value and the data set till the external source available (C3 L46 - C4 L9). Therefore, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the above references' teaching with Telia's teaching because it enables the system to sustain its operation even though it loses its external source.

10. Jin and Martin teach all the steps of claim **11 and 18**, except for the data set comprises a plurality of coefficients for generating future time information based on upon a start time (weightings, column 3, line 56). In an analogous art, Telia teaches the concept of using coefficients in neural networks. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made for generating future time information based upon a start time because the neural network has to begin its calculations at a starting point data set.

11. Jin and Martin teach in view of Telia teaches all the steps of **claims 12-13 and 19-20**, but not specifically providing at least more than 24 hours are two weeks of future time information using the data set. However, how long the data set should be is purely dependent on the applications and preferences. It would have been obvious to one of ordinary skill in the art at the time the invention was made, to understand that the choice of how long to provide timing information is one of design choice based on user requirements.

12. **Claim 2, 3 and 10, 15, 16** rejected under 35 U.S.C. 103(a) as being unpatentable over **Jin and Martin** (Applicant's admitted prior art) further in view of "Test Results and Analysis of a Low Cost Core GPS Receiver for Time Transfer Applications", IEEE International Frequency Control Symposium, J. Blake Bullock et al., pp. 314-322, (1997).

13. **Jin** in view of **Martin** teach all the limitation of **claims 2 and 15**, except wherein the data set is useful for a first time interval and including generating another data set for a second, later time interval. However, Bullock teaches that GPS receivers used for

time synchronization, while very accurate, are known to lose their signals due to, for example, jamming as a result of RF interference. See pages 314-315 and 317.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to modify the method of Jin and Martin to include generating another data set for a later time interval as it is known that GPS signals may be lost as taught by Bullock (pages 314-315 and 317).

14. **Jin and Martin in view of Bullock** teach all the steps of **claims 3 and 16**, including repeatedly generating another data set for subsequent time intervals. See above.

15. **Jin and Martin** teach all the steps of **claim 10**, except for the external source time information comprises GPS time information. In an analogous art, **Bullock** teaches the use of GPS signals as the external source (pages 314-315 and 317). Therefore, it would have been obvious for one skill in the art at the time of the invention to combine Jin and Martin's teaching with Bullock's teaching of using GPS signals as the external time source because this would result in a more accurate global time precision.

#### ***Response to Arguments***

Applicant's arguments filed 7/1/09 have been fully considered but they are not persuasive.

Applicant argues that,

"It is not possible to substitute in Martin's "numeric data time flow" in place of the clock signal recovery technique described in the Jin reference without completely changing the principle of operation of the arrangement in the Jin reference. As stated in MPEP 2143.01(VI), such a modification is not possible for purposes of attempting to manufacture a prima facie



case of obviousness. The proposed combination cannot be made and there is no prima facie case of obviousness."

The examiner respectfully disagrees. Jin teaches a base station controller that determines time information from a global position system (GPS) source of time information and uses the data set for obtaining time information if the GPS source is unavailable to the base station controller. Jin does not explicitly teach that the data set is generated by a neural network to provide future values. **Martin** teaches a known concept of a neural network receiving input past values of a numeric data time flow and outputs its predictive values for the numeric data time flow (Abstract and <Desc/Cims Page Number1>). It is known in the art that the extrapolated/predicted values generated by a neural network yields more adaptively and accurately extrapolated future values than other traditional method of extrapolation. Therefore, it would have been obvious for one skill in the art at the time of the invention to replace Jin's teaching of generating the data set with Martin's teaching of using the neural network to generate/predict/extrapolate future data time flow values, because one of ordinary skill in the art would have been able to carry out such a substitution and the results were reasonably predictable.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **DUNG LAM** whose telephone number is (571) 272-6497. The examiner can normally be reached on M - F 9 - 5:30 pm, Every Other Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Harper can be reached on (571) 272-7605. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/VINCENT P. HARPER/

Supervisory Patent Examiner, Art Unit 2617